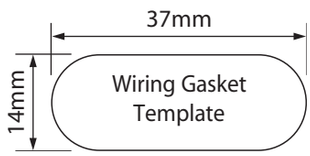
Operating Instructions

Thank you for purchasing the EVX Marine speed control. The Marine EVX speed control requires some special care during installation to protect it from water. Also, provisions for water cooling must be fabricated. Since most installations will be custom, these instructions will provide some general guidelines to assist in proper mounting and setup. The EVX Marine may be used as a direct replacement in the Traxxas Villain EX.

Installation Instructions

The EVX Marine should be installed in a watertight compartment inside the boat. The EVX Marine speed control is NOT waterproof. It is NOT designed to be submerged in water. The EVX Marine speed control can be seriously damaged if it is allowed to get wet. If your boat hull does not have provisions for a sealed compartment, consider fabricating one from a small Tupperware™ or Rubbermaid™ container. If possible install the receiver in the sealed compartment with the speed control. A template is provided to cut out the hole for the speed control wiring gasket. Make sure to seal any screw holes and the water line entry and exit points with silicone sealer. Use ample silicone grease around the wiring gasket to provide a serviceable seal.

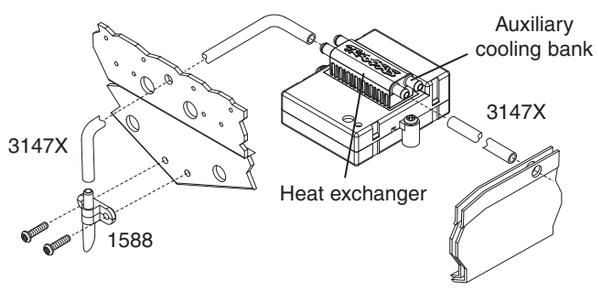


Traxxas has the following parts available from the Villain EX that can assist you in sealing a custom fabricated radio box:

1574 Antenna boot (rubber) (1)/ on-off switch cover (rubber) (1) ..1.50
1577 Boots, pushrod (2) (rubber, for steering rods) 2.00

Water Cooling

Provisions must be made to provide cooling water to the heat exchanger (heat sink). Use standard fuel tubing (Traxxas part #3147X). Position a water pickup at the rear of the boat where it will extend into the high pressure water at the transom. Traxxas makes a plastic water pickup as part #1588, that includes the pickup, the backing plate, and hardware. Otherwise, a short piece of brass tubing cut at a 45-degree angle on the water pickup side will work.



The water cooled heat exchanger has two separate compartments. With stock 550 motors, usually only one bank of the heat exchanger needs to be utilized. With high performance modified motors, it may be necessary to use allow cooling water to flow through both banks. Be careful when working with the heat exchanger. It can break easily if excessive force is applied to it. Make sure all water connections are secure to prevent leakage inside the sealed compartment. The water outlet tube should exit the hull in an area that is highly visible while running the boat. A steady stream of water should always be visible while the boat is running at speed.

Precautions

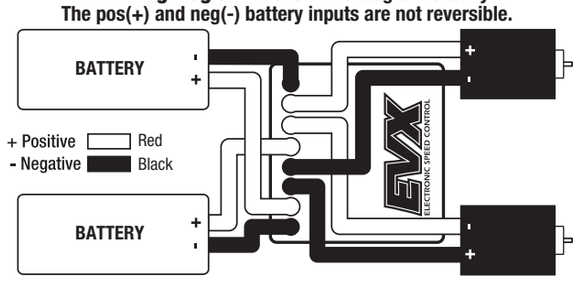
Follow these extra safety precautions for your protection and to ensure long life for the EVX speed control.

- **Disconnect the batteries.** Always disconnect the battery pack from the speed control when not in use.
- **Transmitter on first.** Turn on your transmitter before the speed control so you will have control of the radio equipment.
- **Don't get burned!** The transistor tabs and the heat exchanger can get extremely hot, so be careful not to touch them until they cool.
- **Always use the heat exchanger.** The heat exchanger must be used for maximum cooling and performance. **Do not replace with metal heat sinks!** The Marine EVX is designed to always be used with two motors and two 6-cell battery packs.

These additional precautions apply if the EVX Marine is modified in the future. Please be aware that damage to the speed control caused by modification of the EVX will not be covered by the warranty. This includes changing the connectors.

- **Use stock connectors.** If you decide to change the battery or motor connectors, only change one battery or motor connector at a time. This will prevent accidentally mis-wiring the speed control. If the EVX is not wired exactly as shown in the diagram, it can be damaged!

EVX Wiring Diagram - Follow this diagram exactly!
The pos(+) and neg(-) battery inputs are not reversible.



- **Use neutrally timed motors.** The motors must have 0° timing. Modified motors (with adjustable end bells) timed to 0° or Johnson™/ Mabuchi™ (closed end bell) motors are recommended. Using motors with other than 0° timing will draw excess current in reverse, causing the speed control to overheat and premature motor wear.
- **Motor capacitors required!** Three 0.1µF (50V) ceramic capacitors should be properly installed on every motor to prevent radio interference.
- **No reverse voltage!** The speed control is not protected against reverse polarity voltage. If changing the battery and/or motor, be sure to install the same type of connectors to avoid damage to the speed control. Removing the battery connectors on the speed control or using the same-gender connectors on the speed control will void the EVX warranty.
- **Do not let the transistor tabs touch!** Never allow the three separate transistor banks to touch each other or any exposed metal. This will create a short circuit and damage the speed control.
- **Insulate the wires.** Always insulate exposed wiring with heat shrink tubing to prevent short circuits.
- **Do not use electrically conductive heat sink compound on the heat exchanger.** The transistor tabs must remain electrically isolated.

Transmitter Adjustment (TQ)

Before attempting to program your EVX, it is important to make sure that your transmitter is properly adjusted (set back to the factory defaults). Otherwise, you may not get the best performance from your speed control.

The transmitter should be adjusted as follows:

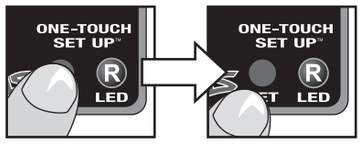
1. Where applicable, set the Throttle Neutral switch to the 70/30 setting. This adjusts the transmitter's throttle trigger throw to 70% for throttle and 30% for brake/reverse.
2. Set the Throttle Trim to the middle "0" setting. This adjusts the neutral position of the throttle servo.
3. Set the Channel 1 Servo Reversing Switch (Traxxas radio system only) to the left position.
4. Do not change the position of any of the servo reversing switches after programming the EVX.

Traxxas, 1100 Klein Road, Plano, TX 75074, Phone: 972-265-8000, Fax: 972-265-8011, e-mail: support@Traxxas.com

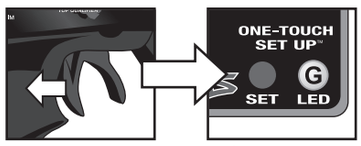
Speed Control Programming

To program the speed control, it should be connected to the receiver, and the transmitter should be adjusted as described in the previous section.

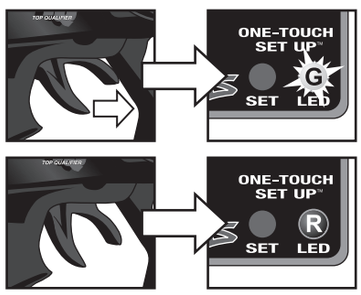
1. Be sure the props are clear.
2. Connect two fully charged battery packs to the speed control. Connect one JST plug (RED & BLACK wires) to one battery pack. Connect the other JST plug to the other battery pack.
3. Turn on the transmitter.
4. Turn on the speed control.
5. With the transmitter throttle at neutral, press and hold the ESC SET button until the status LED turns solid red, and then release the button. You are now in programming mode.



6. Pull the transmitter throttle trigger to the full throttle position. Hold it there until the status LED turns solid green. **Note:** The motors will not run during programming even if they are connected to the speed control.



7. Push the transmitter throttle trigger to full reverse, hold it there until the status LED blinks green.
8. Release the transmitter throttle trigger allowing it to return to neutral. The status LED will turn solid red, indicating that the throttle is at neutral and the programming has been completed.



The EVX speed control is now programmed & ready to go!

- If the transmitter settings are changed, it will be necessary to complete the programming sequence again.
- If the SET button is released before the LED turns solid red in step 5, the LED will blink 7 times and then return to the normal operation mode.
- If you experience any problems during programming, turn off the speed control and repeat the programming steps.

Speed Control Throttle Profile Selection

The EVX has three user-selectable throttle profiles:

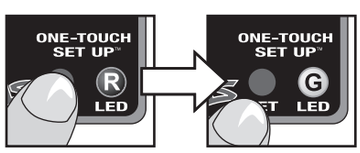
Profile #1: 100% forward, 25% reverse: For applications where reduced speed in the reverse direction is desirable. This is the default profile for marine use.

Profile #2: 100% forward, 100% reverse: For applications where full power reverse is desirable. **This profile is not recommended for marine use. High speeds in reverse can pull the boat underwater.**

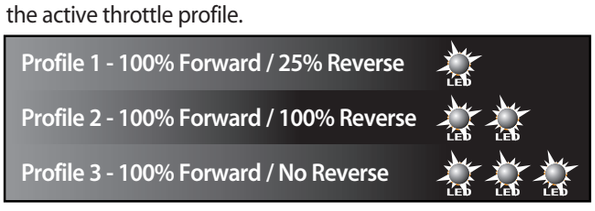
Profile #3: 100% forward, 0% reverse: This profile completely disables reverse for racing use.

To disable the reverse (Profile #3), or to allow full reverse (Profile #2), follow these steps. The speed control should be connected to the receiver and the transmitter adjusted as described above.

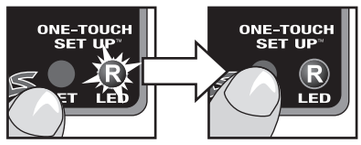
1. Connect two fully charged battery packs to the speed control. Connect one JST plug (RED & BLACK wires) to one battery pack. Connect the other JST plug to the other battery pack.
2. Turn on the transmitter.
3. Turn on the speed control.
4. Press and hold the ESC SET button until the status LED turns from solid red to solid green. Immediately release the ESC SET button when it changes to green.



5. The LED will now flash red. The number of red flashes indicates the active throttle profile.



6. Press the ESC SET button to select the throttle profile. Each press will advance the setting to the next profile. **Note:** To change the profile you must press the ESC SET button immediately after the LED flashes the current setting. Once the LED flashes the desired setting number, wait and the LED will turn green and the EVX will exit the programming mode.



Troubleshooting Guide

This section describes possible speed control problems, causes, and simple solutions. Check these items before contacting Traxxas.

Steering channel works but the motors will not run.

- The speed control has thermally shut down. Allow the speed control to cool down. Use a milder motor or a smaller pinion gear. Check the drive train for restrictions. Check the motor connections. Check the motors.
- One motor is wired backwards. Check the wiring and correct.
- Make sure the speed control is plugged into the throttle channel of the receiver. Check operation of the throttle channel with a servo.
- Possible internal damage. Return the EVX to Traxxas for service.

Receiver glitches/throttle stutters during acceleration.

- Motor capacitors broken or missing - Check and replace capacitors.
- The receiver or antenna is too close to power wires or the batteries.
- Bad connections - Check the wiring and connectors.
- Motor(s) worn - Replace the motors.
- Excessive current to motor - Use a milder motor or a smaller pinion gear.

Motor and steering servo do not work.

- Check the wires, radio system, crystals, battery and motor connectors, and the battery packs.
- Possible internal damage. Return the EVX to Traxxas for service.

Model runs slowly / slow acceleration

- Check the motor and battery connectors.
- Bad battery or motor(s). Check the operation with known good batteries and motors.
- Incorrect transmitter or speed control adjustment. Refer to the "Transmitter Adjustment" or "Speed Control Programming" sections.

Motor runs backwards

- Both motors wired backwards - Check the wiring and correct.
- Backwards motor timing. Reverse the motor end bell.

ESC is melted or burned/ESC runs with the switch off

- Internal damage. Return the EVX to Traxxas for service.

Questions & Support - DO NOT CONTACT NOVAK ELECTRONICS!

All EVX Service and support is only available from Traxxas. If you call Novak Electronics, they are instructed to direct you back to Traxxas. If you require assistance with your EVX speed control, then contact Traxxas customer support at 1-888-TRAXXAS. Hours of operation are Monday-Friday, 8:30am to 9:00pm central time. E-mail technical support is also available at support@Traxxas.com.

A separate card outlining warranty procedures and the Lifetime Electronics Warranty has been included with your EVX package. Please refer to it for specific coverage, costs, and procedures. This information is also available from our website at www.Traxxas.com.

Specifications

Input Voltage (1.2VDC/cell)	12 cells (14.4 volts DC)
Case Width	1.75 inches
Case Depth	2.17 inches
Case Height	0.85 inches
Weight (w/o heat sinks)	3.5 ounces
Motor Limit	19 turns minimum (550 size)
On-Resistance–Forward (@Trans)	0.006
On-Resistance–Reverse (@Trans)	0.006
Rated Current–Forward	160 amps
Rated Current–Reverse	160 amps
Braking Current	320 amps
Continuous Current (@100°F amb.)	30 Amps
Reverse Delay (after Smart Braking)	Zero Seconds
BEC Voltage	5.0 volts DC
BEC Current	1.5 amps
Power Wire	14G / 9"
Input Harness	26G / 9"
Switch Harness	26G / 6"
Transistor Type	HYPERFET III
PWM Frequency	1000 Hertz
Protection	Thermal Shutdown

If you have questions or need technical assistance, call Traxxas at

1-888-TRAXXAS

(1-888-872-9927) (U.S. residents only)

© Copyright Traxxas 2004. Novak and the Novak logo are ©2003 Novak Electronics, Inc., One Touch Set-Up,™ Smart Braking,™ Polar Drive Circuitry,™ Radio Priority Circuitry,™ and Reverse Disable Circuitry™ are trademarks of Novak Electronics, Inc.